

**REMARKS**

Claims 5-10, 12-20 are now pending. Claims 18-20 have been added. Claims 1-17 are rejected by the Examiner.

Claims 1-4 and 11 have been canceled without prejudice.

Claim 5 has been amended to recite that the injection moulded article has “a density of 905 to 930 kg/m<sup>3</sup>.” Support for this amendment is found in original Claim 11 and in the specification at page 9, line 32.

Claims 6-8, 10, and 12-15 have been amended to replace the term “bimodal” with the term “multimodal.” Support for this amendment is found in the specification at, *inter alia*, page 3, lines 4-10; lines 18-19; 26-32, page 5, lines 28-29; and page 9, line 31 to page 10, line 4.

Claim 6 has been further amended to place a semi-colon after the word “ethylene.”

Claim 7 has been further amended to place a semi-colon after the word “1-hexene.”

Claim 8 has been further amended to place a colon after the word “comprising,” to replace the comma after the word “1-hexene” with a semi-colon, and to reformat the text to improve the readability.

Claim 9 has been amended to correct a typographical error wherein the claim now recites “40:60 wt%” instead of “40:60%wt.”

Claim 17 has been amended to correct the spelling of the word “polymerizing” and to replace the colon after the word “catalyst” with a semi-colon.

Claims 18-20 have been added to further define multimodal polyethylene composition of Claim 5. Support for this amendment is found in original Claims 2-4 and page 3, lines 18-32.

By the amendments herein no new matter has been added.

**Rejection under 35 U.S.C. §112**

The Examiner rejects Claims 1-17 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. The Examiner’s rejection is respectfully traversed.

Under part (a) the Examiner rejects Claims 1-4 as allegedly being unclear what method/process the applicant is intending to encompass. Cancellation of Claims 1-4 obviates the Examiner's rejection under part (a).

Under part (b) the Examiner rejects Claims 1-4 under 35 U.S.C. §101 as allegedly failing to set forth in a claim reciting a use any steps involved in the claimed process, thereby resulting in an improper definition of a process. Cancellation of Claims 1-4 obviates the Examiner's rejection under part (b).

Under part (c) the Examiner rejects Claims 1-17 because it allegedly cannot be determined whether the phrase "comprising as comonomers to ethylene at least two C<sub>4-12</sub> alpha olefins" is meant to require: a) two ethylene copolymers wherein each includes a different C<sub>1-4</sub> alpha olefin or b) a terpolymer wherein ethylene is copolymerized with two C<sub>4-12</sub> alpha olefin monomers. Applicants disagree. Claim 5 is clear as to its meaning.

The disclosed multimodal polyethylenes are polymers that are composed of low and high molecular weight fractions. These polymers are designed to have a certain balance between fair processability and good mechanical strength properties. The low molecular weight fractions improve the processability properties of the polymer and the high molecular weight fractions improve mechanical properties.

The injection moulded article recited in Claim 5 is produced from a *multimodal* polyethylene composition. A terpolymer, as suggested in choice (b) of the Examiner's rejection, wherein ethylene is copolymerized with two C<sub>4-12</sub> alpha olefin monomers, would result in a unimodal polymer regardless of the fact the terpolymer comprises two C<sub>4-12</sub> alpha olefin monomers.

Example 2 clearly describes the formation of a multimodal polyethylene composition as recited in Claim 5. In a first step ethylene is polymerized with 1-butene (See page 13, lines 24-25.). The thus formed lower molecular weight polymer is transferred to a gas phase reactor wherein ethylene and 1-hexene are introduced. Example 2 at page 14, line 12 states, "[t]he concentration of 1-butene was so low that it could not be detected by the on-line gas

chromatograph.” At this point in the process there is no 1-butene to further react with ethylene or 1-hexene. This second polymerization step involving ethylene and 1-hexene forms the higher molecular weight portion of the polyethylene composition. Thus a multimodal polyethylene composition is produced – a first fraction having a lower molecular weight comprising 1-butene and ethylene and a second fraction having a higher molecular weight comprising 1-hexene and ethylene.

By contrast a terpolymer formed by combining ethylene, 1-butene, and 1-hexene and polymerizing the admixture, as suggested in the Examiner’s alternate interpretation of Claim 5, would result in a unimodal polyethylene composition. There would be no discrete higher or lower molecular weight fractions in the resulting polymer.

Applicants respectfully request reconsideration and withdrawal of the rejection of the Claims under 35 U.S.C. §112, second paragraph.

**Rejection under 35 U.S.C. §103(a)**

The Examiner rejects Claims 1-3, 5-7, 9, 10, 14, 15, and 16 under 35 U.S.C. §103(a) as allegedly being obvious over patent publication US 2005/0170112, to Lequeux *et al.* (hereinafter “Lequeux”). The Examiner’s rejection is respectfully traversed.

The Examiner states that Lequeux discloses multimodal polyethylene comprising a lower MW ethylene homopolymer or copolymer and a higher MW ethylene copolymer comprising one or more of butene, pentene, hexene, or octene. In addition, the Examiner admits that the multimodal polyethylene compositions recited in the claims are “unexemplified” in Lequeux. However, the Examiner asserts that one of ordinary skill would still be motivated to, “include a terpolymer of ethylene with two of butene, pentene, hexene or octane because such use is suggested in [0013].” Moreover, the Examiner argues that, although unreported, “the claimed low levels of extractables and migration would be expected in view of the recommended use of metallocene catalysts.”

Claim 5 now recites the feature of former claim 11 that the injection moulded article has “a density of 905 to 930 kg/m<sup>3</sup>.” Lequeux teaches away from Applicants’ claimed density range. Lequeux at paragraph [0010] discloses a polyethylene resin preferably having a density from 930 to 965 kg/m<sup>3</sup>. Lequeux teaches away from the claimed range when Lequeux states, “[i]f the following injection moulding the density is lower than 930 to 965 kg/m<sup>3</sup>, then the creep resistance of the component may be insufficient for use in an automobile fuel tank.”

Indeed, the Examiner appears to concur with this view because the Examiner did not reject Claim 11 in the present Office Action. Therefore, amended Claim 5, which incorporates the density feature of claim 11, and the claims depending therefrom are non-obvious in view of Lequeux.

Also, as to claim 15, as to the Examiner’s point that there is a connection between the low levels of extractables and migration due to the recommended use of metallocene catalysts, the only basis the Examiner provides for this argument is the disclosure of paragraphs [0015] – [0044] of Lequeux’s specification. A fair reading of this section of the specification teaches nothing other than the chemical composition of Ziegler-Natta catalysts that can be used to form the polymers disclosed in Lequeux. There is no disclosure suggesting that migration or the amount of material that is hexane extractable is in any way related to the choice of catalyst.

In summary, the claims as amended are non-obvious over the cited reference. Claim 5 now recites the density of 905 to 930 kg/m<sup>3</sup> found in original Claim 11, which was not rejected under 35 U.S.C. §103(a) by the Examiner. For the reasons stated herein the Examiner is respectfully requested to withdraw the rejection of the claims under 35 U.S.C. §103(a).

### **Priority**

The Examiner in the Office Action alleges Applicants have not complied with the requirements of 37 C.F.R. §1.63(c), since the oath, declaration or application data sheet does not acknowledge the filing of the correct foreign application. The Examiner has pointed out that the original Declaration claiming priority to GB 0317012.0 should instead read GB 0317012.3.

**ATTORNEY DOCKET NO. 04150.0024U1**  
**APPLICATION NO. 10/561,482**

Applicants have corrected this typographical error by submitting herewith a new Declaration under 35 U.S.C. § 119. Submission of this corrected Declaration obviates the incorrect priority claim.

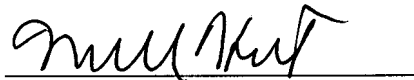
**CONCLUSION**

Pursuant to the above Remarks, reconsideration and allowance of the pending application is believed to be warranted. The Examiner is invited and encouraged to directly contact the undersigned if such contact may enhance the efficient prosecution of this application to issue.

A Credit Card Payment Form PTO-2038 authorizing payment in the amount of \$1,020.00, which includes the fee under 37 C.F.R. § 1.17(a)(3) for a Three-Month Extension of Time is enclosed. This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 14-0629.

Respectfully submitted,

NEEDLE & ROSENBERG, P.C.



Mitchell A. Katz

Registration No. 33,919

NEEDLE & ROSENBERG, P.C.

Customer Number 23859

(678) 420-9300 Phone

(678) 420-9301 Fax

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence and any documents referenced herein as being enclosed herein are being deposited with the United States Postal Service in an envelope addressed to: MAIL STOP AMENDMENT, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, on the date below.

  
Mitchell A. Katz

27 June 2007  
Date